

# World Journal of *Clinical Cases*

*World J Clin Cases* 2022 May 26; 10(15): 4713-5123



## Contents

Thrice Monthly Volume 10 Number 15 May 26, 2022

## EDITORIAL

- 4713 Diet and intestinal bacterial overgrowth: Is there evidence?

*Souza C, Rocha R, Cotrim HP*

## MINIREVIEWS

- 4717 Definition and classification of acute-on-chronic liver diseases

*Zhang YY, Meng ZJ*

- 4726 Management of neurosurgical patients during coronavirus disease 2019 pandemics: The Ljubljana, Slovenia experience

*Velmar T, Bosnjak R*

## ORIGINAL ARTICLE

## Clinical and Translational Research

- 4737 Glycolytic and fatty acid oxidation genes affect the treatment and prognosis of liver cancer

*Zou JY, Huang YJ, He J, Tang ZX, Qin L*

- 4761 Detection of a novel panel of 24 genes with high frequencies of mutation in gastric cancer based on next-generation sequencing

*Zeng HH, Yang Z, Qiu YB, Bashir S, Li Y, Xu M*

## Case Control Study

- 4776 Outcomes of cervical degenerative disc disease treated by anterior cervical discectomy and fusion with self-locking fusion cage

*Zhang B, Jiang YZ, Song QP, An Y*

- 4785 Impact of COVID-19 pandemic on clinicopathological features of transplant recipients with hepatocellular carcinoma: A case-control study

*Akbulut S, Sahin TT, Ince V, Yilmaz S*

## Retrospective Study

- 4799 Risk factors and optimal predictive scoring system of mortality for children with acute paraquat poisoning

*Song Y, Wang H, Tao YH*

- 4810 Application effect of thoracoscopic tricuspid valvuloplasty in geriatric patients with tricuspid valve disease

*Jiang W, Long XM, Wei KQ, Li SC, Zhang Z, He BF, Li H*

- 4818 Endoscopic ultrasonography in the evaluation of condition and prognosis of ulcerative colitis

*Jin RF, Chen YM, Chen RP, Ye HJ*

- 4827** Dynamic interaction nursing intervention on functional rehabilitation and self-care ability of patients after aneurysm surgery

*Xie YE, Huang WC, Li YP, Deng JH, Huang JT*

### Clinical Trials Study

- 4836** Validations of new cut-offs for surgical drains management and use of computerized tomography scan after pancreatoduodenectomy: The DALCUT trial

*Caputo D, Coppola A, La Vaccara V, Passa R, Carbone L, Ciccozzi M, Angeletti S, Coppola R*

### Observational Study

- 4843** Psychosocial adaptation and influencing factors among patients with chemotherapy-induced peripheral neuropathy

*Zhou X, Wang DY, Ding CY, Liu H, Sun ZQ*

### META-ANALYSIS

- 4856** Outcome of the efficacy of Chinese herbal medicine for functional constipation: A systematic review and meta-analysis

*Lyu Z, Fan Y, Bai Y, Liu T, Zhong LL, Liang HF*

### CASE REPORT

- 4878** Familial gastrointestinal stromal tumors with *KIT* germline mutation in a Chinese family: A case report

*Yuan W, Huang W, Ren L, Xu C, Luan LJ, Huang J, Xue AW, Fang Y, Gao XD, Shen KT, Lv JH, Hou YY*

- 4886** Nonfunctional pancreatic neuroendocrine tumours misdiagnosed as autoimmune pancreatitis: A case report and review of literature

*Lin ZQ, Li X, Yang Y, Wang Y, Zhang XY, Zhang XX, Guo J*

- 4895** Sudden deafness as a prodrome of cerebellar artery infarction: Three case reports

*Li BL, Xu JY, Lin S*

- 4904** Importance of abdominal X-ray to confirm the position of levonorgestrel-releasing intrauterine system: A case report

*Maebayashi A, Kato K, Hayashi N, Nagaishi M, Kawana K*

- 4911** Bedside ultrasonic localization of the nasogastric tube in a patient with severe COVID-19: A case report

*Zhu XJ, Liu SX, Li QT, Jiang YJ*

- 4917** Paradoxical herniation after decompressive craniectomy provoked by mannitol: A case report

*Du C, Tang HJ, Fan SM*

- 4923** Targeted next-generation sequencing identifies a novel nonsense mutation in ANK1 for hereditary spherocytosis: A case report

*Fu P, Jiao YY, Chen K, Shao JB, Liao XL, Yang JW, Jiang SY*

- 4929** Nonfunctional bladder paraganglioma misdiagnosed as hemangioma: A case report

*Chen J, Yang HF*

- 4935** Special type of Wernekink syndrome in midbrain infarction: Four case reports  
*Yang YZ, Hu WX, Zhai HJ*
- 4942** Primary extraskeletal Ewing's sarcoma of the lumbar nerve root: A case report  
*Lei LH, Li F, Wu T*
- 4949** Yellow nail syndrome accompanied by minimal-change nephrotic syndrome: A case report  
*Zhang YN, Wang MH, Yu WC, Cheng W, Cong JP, Huang XP, Wang FF*
- 4957** Total femur replacement with 18 years of follow-up: A case report  
*Yang YH, Chen JX, Chen QY, Wang Y, Zhou YB, Wang HW, Yuan T, Sun HP, Xie L, Yao ZH, Yang ZZ*
- 4964** Male metaplastic breast cancer with poor prognosis: A case report  
*Kim HY, Lee S, Kim DI, Jung CS, Kim JY, Nam KJ, Choo KS, Jung YJ*
- 4971** CD8-positive indolent T-Cell lymphoproliferative disorder of the gastrointestinal tract: A case report and review of literature  
*Weng CY, Ye C, Fan YH, Lv B, Zhang CL, Li M*
- 4985** Bone flare after initiation of novel hormonal therapy in patients with metastatic hormone-sensitive prostate cancer: A case report  
*Li KH, Du YC, Yang DY, Yu XY, Zhang XP, Li YX, Qiao L*
- 4991** Postoperative infection of the skull base surgical site due to suppurative parotitis: A case report  
*Zhao Y, Zhao Y, Zhang LQ, Feng GD*
- 4998** Blunt aortic injury-traumatic aortic isthmus pseudoaneurysm with right iliac artery dissection aneurysm: A case report  
*Fang XX, Wu XH, Chen XF*
- 5005** Extensive complex thoracoabdominal aortic aneurysm salvaged by surgical graft providing landing zone for endovascular graft: A case report  
*Jang AY, Oh PC, Kang JM, Park CH, Kang WC*
- 5012** Gastric heterotopia of colon found cancer workup in liver abscess: A case report  
*Park JG, Suh JI, Kim YU*
- 5018** Clinical manifestations and gene analysis of Hutchinson-Gilford progeria syndrome: A case report  
*Zhang SL, Lin SZ, Zhou YQ, Wang WQ, Li JY, Wang C, Pang QM*
- 5025** Neurocutaneous melanosis with an intracranial cystic-solid meningeal melanoma in an adult: A case report and review of literature  
*Liu BC, Wang YB, Liu Z, Jiao Y, Zhang XF*
- 5036** Metastasis of liver cancer to the thyroid after surgery: A case report  
*Zhong HC, Sun ZW, Cao GH, Zhao W, Ma K, Zhang BY, Feng YJ*

- 5042** Spontaneous liver rupture following SARS-CoV-2 infection in late pregnancy: A case report  
*Ambrož R, Stašek M, Molnár J, Špička P, Klos D, Hambálek J, Skanderová D*
- 5051** Carotid blowout syndrome caused by chronic infection: A case report  
*Xie TH, Zhao WJ, Li XL, Hou Y, Wang X, Zhang J, An XH, Liu LT*
- 5057** Is repeat wide excision plus radiotherapy of localized rectal melanoma another choice before abdominoperineal resection? A case report  
*Chiu HT, Pu TW, Yen H, Liu T, Wen CC*
- 5064** Metaplastic breast cancer with chondrosarcomatous differentiation combined with concurrent bilateral breast cancer: A case report  
*Yang SY, Li Y, Nie JY, Yang ST, Yang XJ, Wang MH, Zhang J*
- 5072** Rare solitary splenic metastasis from a thymic carcinoma detected on fluorodeoxyglucose-positron emission tomography: A case report  
*Tsai YH, Lin KH, Huang TW*
- 5077** Type A aortic dissection following heart transplantation: A case report  
*Zeng Z, Yang LJ, Zhang C, Xu F*
- 5082** Catheter-related infections caused by *Mycobacterium abscessus* in a patient with motor neurone disease: A case report  
*Pan SF, Zhang YY, Wang XZ, Sun JJ, Song SL, Tang YR, Wang JL*
- 5088** Clear aligner treatment for a four-year-old patient with anterior cross-bite and facial asymmetry: A case report  
*Zou YR, Gan ZQ, Zhao LX*
- 5097** Knot impingement after arthroscopic rotator cuff repair mimicking infection: A case report  
*Kim DH, Jeon JH, Choi BC, Cho CH*
- 5103** Solitary primary pulmonary synovial sarcoma: A case report  
*He WW, Huang ZX, Wang WJ, Li YL, Xia QY, Qiu YB, Shi Y, Sun HM*
- 5111** Anesthetic management for intraoperative acute pulmonary embolism during inferior vena cava tumor thrombus surgery: A case report  
*Hsu PY, Wu EB*
- 5119** Delayed diagnosis of arytenoid cartilage dislocation after tracheal intubation in the intensive care unit: A case report  
*Yan WQ, Li C, Chen Z*

**ABOUT COVER**

Editorial Board Member of *World Journal of Clinical Cases*, Jing Yang, MD, Associate Professor, Department of the First General Surgery, Gansu Provincial Hospital, Lanzhou 730000, Gansu Province, China. 21634604@qq.com

**AIMS AND SCOPE**

The primary aim of *World Journal of Clinical Cases* (WJCC, *World J Clin Cases*) is to provide scholars and readers from various fields of clinical medicine with a platform to publish high-quality clinical research articles and communicate their research findings online.

WJCC mainly publishes articles reporting research results and findings obtained in the field of clinical medicine and covering a wide range of topics, including case control studies, retrospective cohort studies, retrospective studies, clinical trials studies, observational studies, prospective studies, randomized controlled trials, randomized clinical trials, systematic reviews, meta-analysis, and case reports.

**INDEXING/ABSTRACTING**

The WJCC is now indexed in Science Citation Index Expanded (also known as SciSearch®), Journal Citation Reports/Science Edition, Scopus, PubMed, and PubMed Central. The 2021 Edition of Journal Citation Reports® cites the 2020 impact factor (IF) for WJCC as 1.337; IF without journal self cites: 1.301; 5-year IF: 1.742; Journal Citation Indicator: 0.33; Ranking: 119 among 169 journals in medicine, general and internal; and Quartile category: Q3. The WJCC's CiteScore for 2020 is 0.8 and Scopus CiteScore rank 2020: General Medicine is 493/793.

**RESPONSIBLE EDITORS FOR THIS ISSUE**

Production Editor: Ying-Yi Yuan; Production Department Director: Xiang Li; Editorial Office Director: Jin-Lei Wang.

**NAME OF JOURNAL**

*World Journal of Clinical Cases*

**ISSN**

ISSN 2307-8960 (online)

**LAUNCH DATE**

April 16, 2013

**FREQUENCY**

Thrice Monthly

**EDITORS-IN-CHIEF**

Bao-Gan Peng, Jerzy Tadeusz Chudek, George Kontogeorgos, Maurizio Serati, Ja Hyeon Ku

**EDITORIAL BOARD MEMBERS**

<https://www.wjgnet.com/2307-8960/editorialboard.htm>

**PUBLICATION DATE**

May 26, 2022

**COPYRIGHT**

© 2022 Baishideng Publishing Group Inc

**INSTRUCTIONS TO AUTHORS**

<https://www.wjgnet.com/bpg/gerinfo/204>

**GUIDELINES FOR ETHICS DOCUMENTS**

<https://www.wjgnet.com/bpg/GerInfo/287>

**GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH**

<https://www.wjgnet.com/bpg/gerinfo/240>

**PUBLICATION ETHICS**

<https://www.wjgnet.com/bpg/GerInfo/288>

**PUBLICATION MISCONDUCT**

<https://www.wjgnet.com/bpg/gerinfo/208>

**ARTICLE PROCESSING CHARGE**

<https://www.wjgnet.com/bpg/gerinfo/242>

**STEPS FOR SUBMITTING MANUSCRIPTS**

<https://www.wjgnet.com/bpg/GerInfo/239>

**ONLINE SUBMISSION**

<https://www.f6publishing.com>



Observational Study

# Psychosocial adaptation and influencing factors among patients with chemotherapy-induced peripheral neuropathy

Xiao Zhou, Dong-Yang Wang, Cai-Yan Ding, Hui Liu, Zhi-Qin Sun

**Specialty type:** Oncology

**Provenance and peer review:**

Unsolicited article; Externally peer reviewed.

**Peer-review model:** Single blind

**Peer-review report's scientific quality classification**

Grade A (Excellent): 0  
Grade B (Very good): B, B  
Grade C (Good): C  
Grade D (Fair): 0  
Grade E (Poor): 0

**P-Reviewer:** Kamalabadi-Farahani M, Iran; Kinami S, Japan; Kolat D, Poland

**Received:** December 11, 2021

**Peer-review started:** December 11, 2021

**First decision:** January 26, 2022

**Revised:** February 3, 2022

**Accepted:** March 27, 2022

**Article in press:** March 27, 2022

**Published online:** May 26, 2022



**Xiao Zhou**, Changzhou School of Clinical Medicine, Nanjing Medical University, Changzhou 213000, Jiangsu Province, China

**Dong-Yang Wang**, Department of Nursing, School of Pharmacy, Changzhou University, Changzhou 213000, Jiangsu Province, China

**Dong-Yang Wang**, Faculty of Nursing, Mahidol University, Nakhon Pathom 73170, Thailand

**Cai-Yan Ding, Zhi-Qin Sun**, Department of Nursing, The Affiliated Changzhou Second People's Hospital of Nanjing Medical University, Changzhou 213000, Jiangsu Province, China

**Hui Liu**, School of Nursing, Bengbu Medical College, Bengbu 233000, Jiangsu Province, China

**Corresponding author:** Zhi-Qin Sun, MM, RN, Dean, Professor, Department of Nursing, The Affiliated Changzhou Second People's Hospital of Nanjing Medical University, Gehu Street, Changzhou 213000, Jiangsu Province, China. [zqs1201@163.com](mailto:zqs1201@163.com)

## Abstract

### BACKGROUND

Chemotherapy-induced peripheral neuropathy (CIPN) is a severe and long-lasting side effect caused by various anticancer agents that damage sensory, motor and autonomic nerves. It can cause maladaptive behaviors, including disease severity, anxiety, depression, sleep disorders, falls, and social impairment. These disorders have physical, psychological and social effects on patients and can seriously influence their quality of life.

### AIM

To investigate the current situation of psychosocial adaptation to the disease and its influencing factor in patients with CIPN.

### METHODS

A convenience sampling method was used to select 233 patients with CIPN in our hospital from February to August 2021. In addition, a cross-sectional survey was conducted using a sociodemographic questionnaire, the Self-Report Psychosocial Adjustment to Illness Scale, and the European Organisation for the Research and Treatment of Cancer Quality of Life CIPN20 (QLQ-CIPN20). Factors influencing psychosocial adaptation in patients with CIPN were analyzed by *t*-test or one-way analysis of variance, correlation analysis, multiple stepwise regression analysis,

and structural equation models.

## RESULTS

The psychosocial adaptation score of patients with CIPN was  $52.51 \pm 13.18$ . Multivariate analysis showed that autonomic nerves, tumor stage, motor nerves, education level, availability of caregivers, semi-retirement status, CIPN grade were independent risk factors for patients with CIPN ( $P < 0.05$ ). Structural equation models showed that QLQ-CIPN20 mediated the relationship between CIPN grade, tumor stage, and psychosocial adaptation.

## CONCLUSION

Patients with CIPN have poor psychosocial adaptation and are affected by a variety of physiological, psychological, and social factors. Patients' adaptive responses should be assessed, and targeted interventions implemented.

**Key Words:** Chemotherapy-induced peripheral neuropathy; Cancer; Peripheral neurotoxicity; Psychosocial adaptation; Quality of life

©The Author(s) 2022. Published by Baishideng Publishing Group Inc. All rights reserved.

**Core Tip:** The incidence of chemotherapy-induced peripheral neuropathy (CIPN) is approximately 47% after 6 years of treatment, which severely affects the level of patient adaptation. Most studies have focused on interventions to alleviate the symptoms of neurotoxicity in patients, but there has been less focus on psychosocial adaptation. In this study, we investigated the psychosocial adaptation of 233 patients with CIPN to analyze the factors influencing their psychosocial adaptation.

**Citation:** Zhou X, Wang DY, Ding CY, Liu H, Sun ZQ. Psychosocial adaptation and influencing factors among patients with chemotherapy-induced peripheral neuropathy. *World J Clin Cases* 2022; 10(15): 4843-4855

**URL:** <https://www.wjgnet.com/2307-8960/full/v10/i15/4843.htm>

**DOI:** <https://dx.doi.org/10.12998/wjcc.v10.i15.4843>

## INTRODUCTION

Chemotherapy-induced peripheral neuropathy (CIPN) is one of the common side effects of cancer treatment. The taxane, platinum, and vinca alkaloids are the agents most commonly associated with CIPN. It can cause dysfunction of motor, sensory and autonomic neurons, manifesting as signs and symptoms of peripheral neuropathic, including sensory damage[1]. The mechanisms of peripheral neuropathy induced by oxaliplatin and taxane drugs are ion channels altering the excitability of peripheral neurons, mitochondrial damage leading to peripheral nerve apoptosis, and inflammation leading to nociceptor sensitization and the development of neuroinflammation[2,3]. Taxane-induced peripheral neuropathy causes microtubule disruption, which impairs axonal transport and leads to Wallerian degeneration, altered activity of ion channels, and hyperexcitability of peripheral neurons[2,3].

The predominant symptom of CIPN is sensory nerve damage, which manifests as paresthesia, numbness and tingling, sensory dullness, burning and shooting pain, and electric shock-like pain[4]. Motor nerve damage can be manifested as weakness, gait and balance disturbance, and difficulties in fine motor skills[5,6]. Furthermore, autonomic nerve damage leads to dizziness, blurred vision, constipation, orthostatic hypotension, and erectile dysfunction[7,8]. CIPN can cause persistent pain, loss of fine sensation, and muscle weakness, leading to disability in severe cases[4,9,10]. These symptoms affect physical, psychological and social functioning, frequently with ineffective adaptive behaviors, such as falls, fractures, anxiety and depression, fatigue, sleep disturbance, and social impairment[10,11]. The severity of CIPN symptoms causes alterations in the psychological and social functioning of patients, and psychology can influence the progression of CIPN through biological mechanisms[12]. Compared to pain, numbness and tingling appear earlier and are more problematic. These symptoms usually start at the end of the limb and progress to the proximal end as the condition worsens. After the treatment, there is an improvement over time, but some patients continue to have symptoms for many years[4]. Among patients with advanced lung cancer treated with oxaliplatin regimens, 53.8% reported sensorineural impairment, and 47.3% reported motor neuron impairment[1]. Selvy *et al*[9] showed that 36.5% of patients still had CIPN 5 years after the end of oxaliplatin chemotherapy.

In contrast, 1 year after the end of paclitaxel treatment, 31.5% of breast cancer patients developed motor nerve disorders, and 21.3% of patients experienced sensory nerve disorders[12]. Winters-Stone *et*



*al*[10] showed that 47% of women still had CIPN symptoms after an average of 6 years of treatment with paclitaxel. This result may be related to the different chemotherapeutic agents. Wang *et al*[13] investigated breast cancer patients that were newly diagnosed and treated with paclitaxel. The results showed that the severity of CIPN gradually increased from before to the end of chemotherapy, with patients experiencing the most severe neurotoxicity at the end. Neuropathic pain was reported in 12.5% of patients and neuropathy in 73.9% of patients, followed by progressive improvement, but 62.5% of participants still had CIPN 3 mo after the end of chemotherapy.

Currently, most studies focus on alleviating the physical symptoms of neurotoxicity, while studies on the psychosocial factors related to CIPN patients are lacking. The potential relationship between CIPN and psychosocial adaptation is also unclear. CIPN affects the quality of life and adaptive behavior, while the degree of adaptation affects the quality of life, indicating that quality of life may mediate CIPN and psychosocial adaptation. Therefore, the objective of this study was to investigate the factors influencing the level of psychosocial adaptation in patients with CIPN. In order to reveal the complex relationships among the factors and further explore the mediating effects of quality of life, structural equation modeling was used to analyze the effects of each variable on psychosocial adaptation. The findings of this study can provide a reference for improving the level of patient adaptation in the future.

## MATERIALS AND METHODS

### Study design

We conducted a cross-sectional study of 233 patients with CIPN. According to inclusion and exclusion criteria, the patients were selected from a university-affiliated oncology center in Jiangsu Province, China, from February to August 2021.

### Inclusion criteria

The inclusion criteria were: age  $\geq 18$  years; patients diagnosed with CIPN on oxaliplatin or paclitaxel; Eastern Cancer Collaborative Group Physical Status[14] score of 0-2.

### Exclusion criteria

The exclusion criteria were: patients with severe mental and organic illnesses that precluded them from understanding research procedures and questions.

### Variables and measurements

**Sociodemographic information:** The demographic data consisted of 16 items, including gender, age, ethnicity, religiosity, and others; the disease-related data consisted of 14 items, including cancer diagnosis, tumor stage, CIPN grade, and others (Table 1).

### The National Cancer Institute Common Terminology Criteria for Adverse Events, Version 4.0

Neuropathy is graded by the clinicians using The National Cancer Institute Common Terminology Criteria for Adverse Events (NCI-CTCAE)[15] with five grades: Grade 1 is asymptomatic may be accompanied by loss of tendon reflex or paresthesia; Grade 2 is moderate symptoms that limit instrumental activities of daily life; Grade 3 is severe symptoms that limit self-care activities of daily life; Grade 4 is life-threatening consequences or the need for urgent intervention; Grade 5 is death.

### European Organisation for the Research and Treatment of Cancer Quality of Life CIPN20

The European Organisation for the Research and Treatment of Cancer Quality of Life CIPN20 (EORTC QLQ-CIPN20) questionnaire was established by a Dutch scholar Postma[18] in 2005, which is used to assess patient-reported neuropathy in the sensory, motor, and autonomic domains. Each of the 20 items is graded from 1 (not at all) to 4 (very much), and the total scores of the questionnaire are converted to a scale from 0 to 100. Higher scores indicate increased symptom burden. In the CIPN population, the EORTC QLQ-CIPN20 is also a validated tool, showing good internal consistency reliability based on total Cronbach's alpha coefficients of 0.83[16]. The Cronbach's alpha coefficients for QLQ-CIPN20 in this study were 0.84, showing good internal consistency reliability.

### The Self-Report Psychosocial Adjustment to Illness Scale

The Self-Report Psychosocial Adjustment to Illness Scale (PAIS-SR) was constructed by Derogatis *et al* [17] based on PAIS, which was introduced and adapted for China by Yao *et al*[18]. After entry revision and cultural adaptation, seven dimensions consisting of 44 entries were finalized, including health care, professional environment, family environment, sexual relationships, extended family relationships, social environment, and psychological conditions. Each entry has four options and is scored from 0 to 3. The total score is 132, which is categorized into low (0-34), moderate (35-50) and severe (51-132), with higher scores indicating worse psychosocial adaptation. The scale has good internal consistency reliability due to the Cronbach's alpha coefficient of 0.872. The Cronbach's alpha coefficient of this study

**Table 1 Self-Report Psychosocial Adjustment to Illness Scale for patients with different demographic data (means  $\pm$  SD, score) ( $n = 233$ )**

Variables	<i>n</i> (%)	Score	<i>t</i> / <i>F</i>	<i>P</i> value
Age				
≥ 65	118 (50.6)	53.8 $\pm$ 12.21	1.51	0.13
< 65	115 (49.4)	51.19 $\pm$ 14.03		
Ethnicity				
Han ethnicity	231 (99.1)	52.54 $\pm$ 13.18	0.32	0.75
Other	2 (0.9)	49.5 $\pm$ 17.68		
Religiosity				
No	228 (97.9)	52.44 $\pm$ 13.21	-0.56	0.57
Yes	5 (2.1)	55.8 $\pm$ 12.15		
Education level				
Never went to school	25 (10.7)	58.92 $\pm$ 11.09	4.926	0.01
Primary school	48 (20.6)	56.4 $\pm$ 14.93		
Middle school	136 (58.4)	51.22 $\pm$ 12.45		
Junior college	20 (8.6)	45.55 $\pm$ 11.23		
Undergraduate or above	4 (1.7)	44.5 $\pm$ 10.28		
Marital status				
Unmarried	5 (2.1)	45.6 $\pm$ 15.08	0.99	0.4
Married	208 (89.3)	52.99 $\pm$ 12.96		
Divorced	5 (2.1)	50.8 $\pm$ 12.79		
Widowed	15 (6.4)	48.73 $\pm$ 15.65		
Working status				
Full-time	4 (1.7)	46 $\pm$ 16.51	5.94	0.01
Full rest	99 (42.5)	55.3 $\pm$ 12.23		
Semi-retired	19 (8.2)	42.42 $\pm$ 13.28		
Retired	111 (47.6)	51.98 $\pm$ 13.04		
Residence				
Provincial capital	2 (0.9)	41 $\pm$ 18.38	0.77	0.47
Small and medium cities	126 (54.1)	52.64 $\pm$ 13.01		
Rural	105 (45.1)	52.57 $\pm$ 13.34		
Living alone				
No	223 (95.7)	53 $\pm$ 12.98	2.71	0.01
Yes	10 (4.3)	41.6 $\pm$ 13.38		
With caregivers				
No	30 (12.9)	46.57 $\pm$ 13.58	-2.68	0.01
Yes	203 (87.1)	53.39 $\pm$ 12.92		
Medical payments				
Medical insurance	214 (91.8)	52.6 $\pm$ 13.28	0.34	0.74
Self-pay	19 (8.2)	51.53 $\pm$ 12.23		
Cancer diagnoses				
Digestive system	156 (67)	51.79 $\pm$ 12.98	1.87	0.1

Respiratory system	20 (8.6)	54.5 ± 8.55		
Breast cancer and female reproductive system	46 (19.7)	52.67 ± 13.98		
Urinary system	3 (1.3)	52 ± 23.07		
Hematologic and lymphoid neoplasms	6 (2.6)	54.67 ± 15.83		
Other	2 (0.9)	79 ± 7.07		
Tumor stage				
I	4 (1.7)	41 ± 6.78	5.33	0.01
II	40 (17.2)	46.7 ± 13		
III	67 (28.8)	52.18 ± 12.57		
IV	122 (52.4)	54.98 ± 13.01		
CIPN grade				
1	30 (12.9)	51.67 ± 13.55	2.96	0.03
2	162 (69.5)	51.31 ± 12.63		
3	39 (16.7)	57.59 ± 13.78		
4	2 (0.9)	63.5 ± 23.33		
Smoking				
No	228 (97.9)	52.67 ± 13.04	1.26	0.21
Yes	5 (2.1)	45.2 ± 18.7		
Constipation				
No	189 (81.1)	51.59 ± 13.56	-2.24	0.03
Yes	44 (18.9)	56.48 ± 10.63		
Memory difficulties				
No	180 (77.3)	51.73 ± 13.64	-1.68	0.1
Yes	53 (22.7)	55.17 ± 11.19		
Presence of comorbidities				
Yes	156 (67)	53.04 ± 12.95	0.88	0.38
No	77 (33)	51.43 ± 13.64		
Traditional Chinese herbal medicine treatment				
No	220 (94.4)	52.42 ± 13.2	-0.44	0.66
Yes	13 (5.6)	54.08 ± 13.19		
Exercise intensity				
Low	187 (80.3)	54.11 ± 12.87	7.34	0.01
Moderate	32 (13.7)	46.13 ± 12.73		
High	14 (6)	45.79 ± 12.55		
Gender				
Male	116 (49.8)	51 ± 11.83	-1.73	0.08
Female	117 (50.2)	54.02 ± 14.27		
Family per capita monthly income				
< 500	33 (14.2)	55.48 ± 11.91	10.11	0.12
500-999	25 (10.7)	51.52 ± 13.1		
1000-1999	47 (20.2)	55.64 ± 12.64		
2000-2999	51 (21.9)	51.78 ± 11.5		
3000-3999	25 (10.7)	52 ± 14.45		

4000-4999	15 (6.4)	53.93 ± 20.08		
5000 or more	37 (15.9)	47.32 ± 11.97		
Body mass index (BMI) kg/m <sup>2</sup>				
Underweight < 18.5	32 (13.7)	55.66 ± 12.56	2.68	0.26
18.5 ≤ normal weight < 25	161 (69.1)	52.61 ± 12.85		
Overweight ≥ 25	40 (17.2)	49.58 ± 14.58		
Occupation				
Corporate administrators	15 (6.4)	44.73 ± 9.59	20.16	0.01
Professional technical personnel	18 (7.7)	48.5 ± 12.43		
Clerical workers and operations staff	13 (5.6)	46.69 ± 13.19		
Workers and operators	80 (34.3)	55 ± 13.46		
Services	10 (4.3)	45.1 ± 10.99		
Agriculture, forestry, and fishery production personnel	62 (26.6)	54.73 ± 12.52		
Homemaker	13 (5.6)	56.46 ± 13.31		
Freelance	22 (9.4)	50.27 ± 13.62		
Treatment regimen				
Chemotherapy only	58 (24.9)	54.69 ± 11.75	3.73	0.16
Surgery + chemotherapy	146 (62.7)	51.27 ± 14.09		
Chemotherapy + radiotherapy	6 (2.6)	49.17 ± 13.38		
Surgery + chemotherapy + radiotherapy	23 (9.9)	55.78 ± 9.35		
Neurotrophic drugs				
No	217 (93.1)	52.28 ± 13.47	-1.31	0.19
Yes	16 (6.9)	55.63 ± 7.74		

was 0.910, and the retest reliability was 0.921, indicating good reliability and validity.

### Collection process

The researcher used a uniform guideline to explain the purpose of the study and applied a uniform method of filling out the questionnaires. After obtaining the consent of the study participants, the questionnaires were filled out independently and anonymously by the participants. In addition, some questionnaires were completed by the researcher based on the patients' dictation and were collected on the spot to check the completeness. There were 233 questionnaires distributed, and 233 valid questionnaires were collected, with a 100% effective return rate.

### Statistical methods

The data entry on Excel was performed by two researchers, SPSS 26.0 (IBM Corp., Armonk, NY, United States) was used for statistical analysis, and AMOS 24.0 (IBM) was used to construct structural equation models. First, the general information profile of patients was statistically described using mean ± SD and composition ratio. The effects of general demographic and disease-related variables on psychosocial adaptation were analyzed by the independent samples *t*-test or one-way analysis of variance (ANOVA). Pearson correlation analysis was used to explore the correlation between the level of adaptation and QLQ-CIPN20. The statistically significant variables in univariate and correlation analyses were used as independent variables in a multi-distance stepwise regression analysis of psychosocial adaptation. The structural equation models were constructed using AMOS statistical software with PAIS-SR as the endogenous latent variable and QLQ-CIPN20 as the mediating variable. Furthermore, the general information characteristic variables from the multiple linear regression results were selected as the observed variables. The general information characteristic variables were assumed to affect adaptation levels directly and indirectly through QLQ-CIPN20. The great likelihood method was used as the estimation method to test the fit of the theoretical model to the data. The variables with insignificant loadings were removed and adjusted appropriately to obtain the final model. Model  $\chi^2/df < 3$ ; the fitness index, goodness of fit index (GFI), incremental fit index (IFI), and comparative fit index (CFI) values were > 0.9, and the root mean squared error of approximation (RMSEA) value was < 0.08, which was considered a good model fit. The difference was considered statistically significant at  $P < 0.05$ .

## RESULTS

### Sociodemographic information

**Demographic data:** The mean age of 233 patients was  $62.61 \pm 9.89$  years, 116 (49.8%) were male and 117 (50.2%) were female. The majority were Han Chinese ( $n = 231$ , 99.1%), and most patients had no religious affiliation ( $n = 228$ , 97.9%). In addition, most of them had secondary school degrees ( $n = 136$ , 58.4%), and most were married ( $n = 208$ , 89.3%). The mean sleep duration of the patients was  $6.89 \pm 2.09$  h, and the mean body surface area (BSA) was  $1.73 \pm 0.21$  m<sup>2</sup>. Among all the patients, most were semi-retired, and retired ( $n = 99$ , 42.5%;  $n = 111$ , 47.6%), most did not live alone ( $n = 223$ , 95.4%), most had caregivers ( $n = 203$ , 87.1%), and most were covered by health insurance ( $n = 214$ , 91.8%) (Table 1).

**Disease relevant data:** Among 233 patients, most had digestive system disease ( $n = 156$ , 67%), most had stage IV cancer ( $n = 122$ , 52.4%), most had grade 2 CIPN ( $n = 162$ , 69.5%), and mean duration of disease was  $19.21 \pm 23.61$  mo. In the current regimen, the cumulative dose of oxaliplatin was  $889.65 \pm 441.012$  mg, the cumulative dose of taxane was  $1351.98 \pm 808.915$  mg, and the mean number of chemotherapy sessions was  $5.25 \pm 2.96$ . Most patients were nonsmokers ( $n = 228$ , 97.9%), most had constipation ( $n = 189$ , 81.1%), most had memory difficulties ( $n = 180$ , 77.3%), most had comorbidities ( $n = 156$ , 67%), most did not receive herbal treatment ( $n = 220$ , 94.4%), most had low exercise intensity ( $n = 187$ , 80.3%), most received a combination treatment of surgery and chemotherapy ( $n = 146$ , 62.7%), and most did not take neurotrophic drugs ( $n = 217$ , 93.1%) (Table 1).

### Descriptive analysis

The total QLQ-CIPN20 score in this study was  $24.22 \pm 5.8$ , and the dimensions in the order of total score were sensory nerves ( $13.11 \pm 3.31$ ), motor nerves ( $8.94 \pm 2.63$ ), and autonomic nerves ( $2.17 \pm 1.33$ ). The mean total PAIS-SR score of the CIPN patients in this study was  $52.51 \pm 13.18$ , and the dimensions in the order of total score were social environment ( $12.23 \pm 4.81$ ), sexual relationship ( $10.64 \pm 4.19$ ), professional environment ( $9.98 \pm 2.48$ ), psychological conditions ( $6.88 \pm 4.93$ ), health care ( $5.13 \pm 2.75$ ), family environment ( $5.11 \pm 2.72$ ) and extended family relationships ( $2.54 \pm 2.47$ ).

### Divergence analysis

The independent samples *t*-test showed that living alone, having a caregiver, and constipation were significant ( $P < 0.05$  or  $P < 0.01$ ) in PAIS-SR scores. One-way ANOVA showed that education level, current work status, tumors stage, CIPN grade, and occupation were significant ( $P < 0.05$  or  $P < 0.01$ ) in PAIS-SR scores. The results of the correlation analysis showed a significant correlation between BSA, daily sleep duration, and PAIS-SR scores ( $P < 0.01$ ) (Table 1).

### Correlation analysis

The total PAIS-SR scores of patients with CIPN were significantly correlated with sensory, motor and autonomic nerves ( $P < 0.01$ ). Among the dimensions of the PAIS-SR, sensory neuropathy had significant correlations with family environment and psychological conditions ( $P < 0.01$ ). Motor neuropathy had significant correlations with health care, professional environment, family environment, extended family relationships, social environment, and psychological conditions ( $P < 0.05$ ). Autonomic neuropathy was significantly correlated with health care, professional environment, family environment, extended family relationships, social environment, sexual relationships, and psychological conditions ( $P < 0.05$ ) (Table 2).

### Multivariate analysis

The variables that were significant in the ANOVA and those significant in the correlation analysis were used as independent variables for the regression analysis of psychosocial adaptation. Work status and occupation were first set as dummy variables, and then multiple stepwise regression analysis was performed. The results showed that autonomic nerves, tumors stage, motor nerves, living alone, education level, with caregivers, semi-retirement, and CIPN grade were independent risk factors for patients with CIPN ( $P < 0.05$ ) (Table 3).

### The structural equation models

Structural equation models were constructed using tumor stage and CIPN grade as explanatory variables, QLQ-CIPN20 as mediating variables, living alone, with caregivers, semi-retired and education level as control variables, and PAIS-SR as endogenous latent variables. The modified model is shown in Figure 1. The model fit was good ( $\chi^2/df = 1.810$ ; GFI = 0.923; CFI = 0.901; IFI = 0.904; RMSEA = 0.059).

### Direct and indirect effects

The results in Figure 1 are summarized in Table 4, showing that QLQ-CIPN20 and CIPN grade can have a direct effect on PAIS-SR with standardized path coefficients of 0.830 and -0.535, respectively. Tumor stage did not have a direct effect on PAIS-SR. CIPN grade and tumor stage could be mediated by QLQ-CIPN20 to have an indirect effect on PAIS-SR with standardized path coefficients of 0.670 and 0.135,

**Table 2 Correlation analysis of CIPN20 dimensions with Self-Report Psychosocial Adjustment to Illness Scale scores**

		PAIS-SR total score	Sub1	Sub2	Sub3	Sub4	Sub5	Sub6	Sub7
Sensory neuropathy	<i>r</i>	0.206	0.124	0.039	0.172	0.075	0.125	0.059	0.183
	<i>P</i>	0.01	0.06	0.56	0.01	0.25	0.06	0.37	0.01
Motor neuropathy	<i>r</i>	0.356	0.150	0.195	0.254	0.109	0.201	0.140	0.299
	<i>P</i>	< 0.01	0.02	0.01	< 0.01	0.1	0.01	0.03	< 0.01
Autonomic neuropathy	<i>r</i>	0.523	0.178	0.142	0.710	0.167	0.216	0.212	0.378
	<i>P</i>	< 0.01	0.01	0.03	< 0.01	0.01	0.01	0.01	< 0.01

PAIS-SR: Self-Report Psychosocial Adjustment to Illness Scale; Sub1: Health care; Sub2: Professional environment; Sub3: Family environment; Sub4: Sexual environment; Sub5: Extended family relationships; Sub6: Social environment; Sub7: Psychological condition.

**Table 3 Multifactorial analysis of Self-Report Psychosocial Adjustment to Illness Scale scores in patients with chemotherapy-induced peripheral neuropathy**

	$\beta$		B	t	Significant	Collinearity statistics	VIF
	B	SE	Beta			Tolerance	
(Constants)	31.655	4.289		7.380	0.00		
Autonomic neuropathy	4.192	0.526	0.424	7.977	0.01	0.874	1.145
Tumor stage	2.871	0.827	0.178	3.471	0.01	0.938	1.066
Motor neuropathy	1.050	0.309	0.210	3.404	0.01	0.648	1.543
Living alone	-11.250	3.302	-0.173	-3.407	0.01	0.951	1.052
Education level	-2.636	0.815	-0.168	-3.236	0.01	0.918	1.090
With caregivers	4.944	2.000	0.126	2.472	0.01	0.949	1.053
Semi-retired	-5.926	2.454	-0.123	-2.415	0.02	0.944	1.059
CIPN grade	-2.933	1.381	-0.128	-2.124	0.04	0.682	1.466

CIPN: Chemotherapy-induced peripheral neuropathy.

respectively. With caregivers, semi-retirement, and education level directly affected PAIS-SR with standardized path coefficients of 0.181, -0.021, and -0.366, respectively (Table 4).

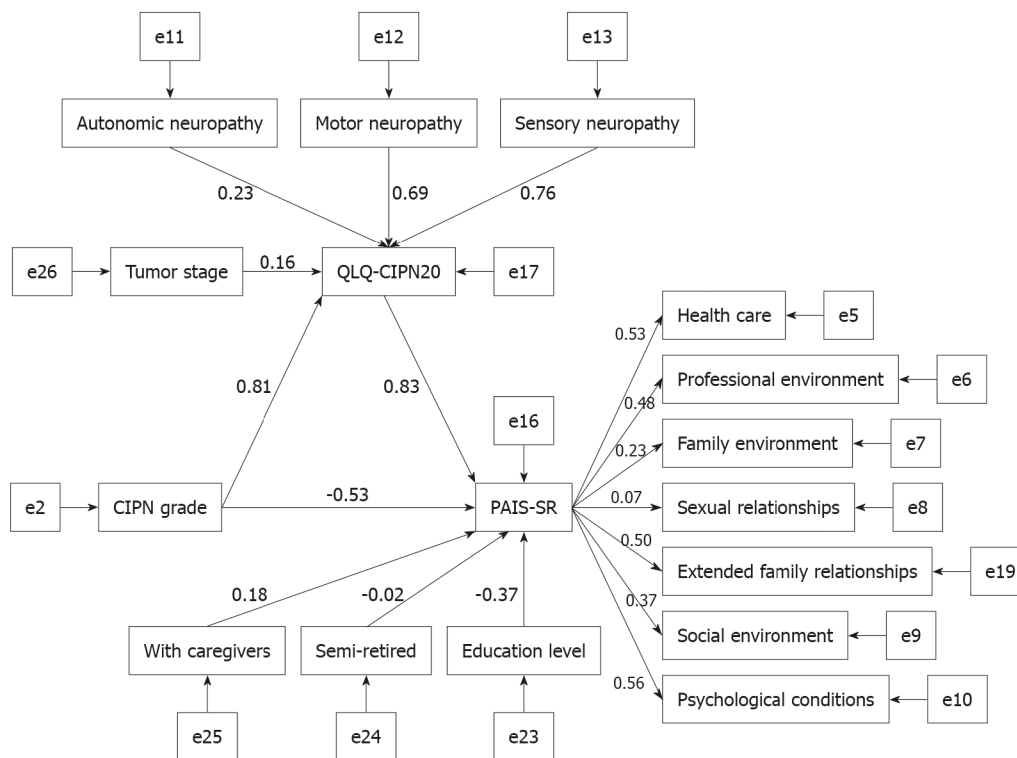
## DISCUSSION

Similar to Winters-Stone *et al*[10], the psychosocial adaptation of patients in this study was at a low level, indicating that neurotoxicity leads to a reduced adaptation level in patients. Among all dimensions, the social environment, sexual relationships, and professional environment had higher scores. Consistent with Tanay *et al*[19], CIPN symptoms predispose patients to conditions such as abandonment of social activities, inability to return to work, and unable to perform normal job duties. Sexual dysfunction due to reduced sexual behavior and intimacy can cause psychological distress, which seriously affects the quality of life of patients[20,21]. Tumor stage has an indirect effect on the psychosocial adaptation of patients with CIPN. This result is consistent with the study of Carreira *et al* [22], where advanced breast cancer survivors can develop psychological adaptation problems such as cognitive impairment, fatigue, and anxiety during the chemotherapy phase. This study also showed that having caregivers, being semi-retired, and education level all directly affect the level of psychosocial adjustment of CIPN patients. This is consistent with previous studies in which CIPN patients with caregivers experienced psychological distress due to forced caregiving[23], cancer survivors who return to work, and reduced overtime hours had improved overall quality of life[24], and patients with higher levels of education are likely to be more understanding and cooperative with treatment[25]. The study showed that multidisciplinary outpatient rehabilitation programs consisting of exercise intervention, psychotherapy, information support and professional counseling with each other can improve the

**Table 4 Analysis of the effect of factors influencing psychosocial adaptation of patients with chemotherapy-induced peripheral neuropathy**

Path	Direct effects	SE	CR	P value	Indirect effects	Total effects
CIPN grade→QLQ-CIPN20	0.808	0.100	4.213	< 0.01		0.808
Tumor stage→QLQ-CIPN20	0.162	0.024	2.477	0.01		0.162
QLQ-CIPN20→PAIS-SR	0.830	1.393	2.875	0.01		0.830
CIPN grade→PAIS-SR	-0.535	0.493	-2.730	0.01	0.670	0.136
Tumor stage→PAIS-SR					0.135	0.135
Semi-retired→PAIS-SR	-0.021	0.386	-0.292	0.77		-0.021
Education level→PAIS-SR	-0.366	0.151	-4.174	< 0.01		-0.366
With caregivers→PAIS-SR	0.181	0.324	2.411	0.02		0.181

PAIS-SR: Self-Report Psychosocial Adjustment to Illness Scale; CIPN: Chemotherapy-induced peripheral neuropathy; QLQ-CIPN20: Quality of Life CIPN20.



DOI: 10.12998/wjcc.v10.i15.4843 Copyright ©The Author(s) 2022.

**Figure 1 Structural equation model of psychosocial adaptation in patients with chemotherapy-induced peripheral neuropathy.**

physical and or psychosocial status of cancer survivors[26]. Our study further demonstrates the psychosocial burden of CIPN patients in the post-chemotherapy setting. Therefore, more high-quality multidisciplinary supportive care needs to be sought to help CIPN patients cope with post-chemotherapy toxicity.

In addition, the results also showed that CIPN grade was an independent influence on psychosocial adaptation of CIPN patients, with a direct positive effect between both. Tanay *et al*[19] found that ineffective adaptation in patients with moderate to severe CIPN includes anxiety, depression, loss of purpose, sleep disturbance, and unable to perform normal job duties and daily activities, severely affecting patients' family, work, social, and leisure activities. A randomized trial of an automated symptom-monitoring system paired with nurse practitioner follow-up related to chemotherapy neurotoxicity symptom management showed effective improvement in patients' psychological status such as fatigue, anxiety and depression, as well as reduction in symptom progression[25]. In addition, cognitive-behavioral therapy for insomnia has been shown to improve insomnia and sleep quality in



cancer patients[27]. Given the uncomfortable response to CIPN, future studies can be extended to CIPN patients, with guidance and self-assessment of the specific effects of the behavioral component. In fact, our findings provide insights for clinical practice. To better improve the level of psychosocial adjustment of patients, interventions developed by health care professionals should include measures that can improve the symptoms of CIPN.

The study showed a significant correlation between QLQ-CIPN20 and PAIS-SR. Sensory, motor and autonomic nerve impairments were all significant for psychosocial adjustment in CIPN patients. Among them, autonomic nerve impairment had the strongest correlation with patients' psychosocial adjustment. Although these symptoms have been under-reported in previous studies[2,4], it has also been shown that autonomic symptoms including dizziness, blurred vision, poor hearing, and sexual dysfunction after chemotherapy affect patients' psychological and emotional state with the expectation of establishing at least a subjective sense of well-being[23]. However, successful adaptation includes: absence of psychological disorders; good functional status; successful mastery of adaptive tasks; low negative and high positive emotions; and satisfaction and well-being in multiple life domains[28]. It is evident that symptom burden has an impact on quality of life and consequently on the level of psychosocial adaptation of patients, where increased attention to autonomic impairment is warranted.

The study showed that QLQ-CIPN20 mediates the role between CIPN grade and PAIS-SR. Our study shows that the quality of life of patients becomes worse due to the severity of CIPN, thus decreasing their level of psychosocial adjustment. Childs *et al*[29] showed that patients with esophageal cancer suffer from neurotoxic symptoms such as weakness in both lower limbs and dizziness at the chemotherapy stage. These symptoms lead to adverse events such as falls and disruption of daily activities, decreasing the quality of life of patients and creating psychosocial maladjustment. In addition, other studies have shown that interventions using a biopsychosocial model can significantly improve the quality of life of patients. Biological, psychological and social-environmental factors can improve clinical outcomes, especially for pain management after cancer, and individual factors should not be underestimated[26]. Another study showed that the level of adaptation of CIPN patients influenced individual coping styles and behavioral patterns[30]. The results show that CIPN patients prefer to improve their psychosocial adjustment by improving the impact of their symptoms on their lives. Therefore, health care professionals should focus on reducing the impact of symptoms on life and develop interventions to improve the level of adaptation of CIPN patients by considering the influencing factors such as biological, psychological, social and individual factors.

The present study was a cross-sectional investigation with limitations in causal relationships between variables. Therefore, further prospective studies could be conducted to clarify the adaptation of patients with CIPN. In addition, the present study was an investigation based on patients' subjective perceptions, which may be subject to recall bias. In the future, qualitative studies can be conducted to address the shortcomings of quantitative studies.

## CONCLUSION

This study highlights that the level of adaptation of patients with CIPN is influenced by physical, psychological, and social factors and should be regularly assessed in multiple ways. The findings of this study will help increase knowledge and evidence of CIPN symptom management and the development of individualized interventions. In addition, this study can help patients and their families to recognize their health needs and to improve the quality of life and level of adjustment of patients in the post-chemotherapy setting.

## ARTICLE HIGHLIGHTS

### Research background

Currently, the prevention and management of patients with chemotherapy-induced peripheral neuropathy (CIPN) are mostly focused on enhancing physical adaptation, and there is a lack of psychosocial adaptation.

### Research motivation

To investigate the current situation of psychosocial adaptation to the disease and its influencing factor in patients with CIPN.

### Research objectives

A total of 233 patients hospitalized with CIPN were enrolled according to the relevant inclusion and exclusion criteria.



### Research methods

A cross-sectional survey was conducted using a sociodemographic questionnaire, the Self-Report Psychosocial Adjustment to Illness Scale, and the European Organisation for the Research and Treatment of Cancer Quality of Life CIPN20 (QLQ-CIPN20). The influencing factors of psychosocial adaptation in patients with CIPN were analyzed by *t*-test or one-way analysis of variance, correlation analysis, multiple stepwise regression analysis, and structural equation models.

### Research results

The psychosocial adaptation score of patients with CIPN was  $52.51 \pm 13.18$ . Multivariate analysis results showed that autonomic nerves, tumor stage, motor nerves, education level, with caregivers, being semi-retired, and CIPN grade were independent risk factors for patients with CIPN. Structural equation models showed that QLQ-CIPN20 mediated the relationship between CIPN grade, tumor stage, and psychosocial adaptation.

### Research conclusions

Patients with CIPN have a poor level of psychosocial adaptation and are affected by a variety of physical, psychological, and social factors.

### Research perspectives

To provide a reference for future psychosocial adaptation interventions with the aim of improving the overall level of psychological adaptation.

---

## FOOTNOTES

**Author contributions:** Zhou X and Wang DY contributed equally to this work; Zhou X and Sun ZQ designed the research study; Zhou X, Ding CY, Liu H performed the research; Zhou X and Wang DY contributed new reagents and analytic tools; Zhou X, Wang DY, Ding CY analyzed the data and wrote the manuscript; All the authors have read and approved the manuscript.

**Supported by** the Nursing Research Project Funding by the Affiliated Changzhou Second People's Hospital of Nanjing Medical University, No. 2020HZD003.

**Institutional review board statement:** The study was reviewed and approved by the Science and Research Office of Changzhou Second People's Hospital (Changzhou).

**Conflict-of-interest statement:** The authors declared that no conflict of interest.

**Data sharing statement:** No data available.

**Open-Access:** This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <https://creativecommons.org/licenses/by-nc/4.0/>

**Country/Territory of origin:** China

**ORCID number:** Xiao Zhou 0000-0001-5247-9867; Dong-Yang Wang 0000-0001-5549-3437; Cai-Yan Ding 0000-0002-5955-9146; Hui Liu 0000-0002-4849-499X; Zhi-Qin Sun 0000-0001-8538-7360.

**S-Editor:** Zhang H

**L-Editor:** Kerr C

**P-Editor:** Zhang H

---

## REFERENCES

- 1 **Hung HW**, Liu CY, Chen HF, Chang CC, Chen SC. Impact of Chemotherapy-Induced Peripheral Neuropathy on Quality of Life in Patients with Advanced Lung Cancer Receiving Platinum-Based Chemotherapy. *Int J Environ Res Public Health* 2021; **18** [PMID: 34073174 DOI: 10.3390/ijerph18115677]
- 2 **Laforgia M**, Lafage C, Calabrò C, Ferraiuolo S, Ungaro V, Tricarico D, Gadaleta CD, Nardulli P, Ranieri G. Peripheral Neuropathy under Oncologic Therapies: A Literature Review on Pathogenetic Mechanisms. *Int J Mol Sci* 2021; **22** [PMID: 33671327 DOI: 10.3390/ijms22041980]
- 3 **Zajęzowska R**, Kocot-Kępska M, Leppert W, Wrzosek A, Mika J, Wordliczek J. Mechanisms of Chemotherapy-Induced

- Peripheral Neuropathy. *Int J Mol Sci* 2019; **20** [PMID: 30909387 DOI: 10.3390/ijms20061451]
- 4 **Loprinzi CL**, Lacchetti C, Bleeker J, Cavaletti G, Chauhan C, Hertz DL, Kelley MR, Lavino A, Lustberg MB, Paice JA, Schneider BP, Lavoie Smith EM, Smith ML, Smith TJ, Wagner-Johnston N, Hershman DL. Prevention and Management of Chemotherapy-Induced Peripheral Neuropathy in Survivors of Adult Cancers: ASCO Guideline Update. *J Clin Oncol* 2020; **38**: 3325-3348 [PMID: 32663120 DOI: 10.1200/JCO.20.01399]
- 5 **Streckmann F**, Zopf EM, Lehmann HC, May K, Rizza J, Zimmer P, Gollhofer A, Bloch W, Baumann FT. Exercise intervention studies in patients with peripheral neuropathy: a systematic review. *Sports Med* 2014; **44**: 1289-1304 [PMID: 24927670 DOI: 10.1007/s40279-014-0207-5]
- 6 **Cavaletti G**, Marmiroli P. Chemotherapy-induced peripheral neurotoxicity. *Curr Opin Neurol* 2015; **28**: 500-507 [PMID: 26197027 DOI: 10.1097/WCO.0000000000000234]
- 7 **Toftthagen C**, Visovsky C, Dominic S, McMillan S. Neuropathic symptoms, physical and emotional well-being, and quality of life at the end of life. *Support Care Cancer* 2019; **27**: 3357-3364 [PMID: 30623244 DOI: 10.1007/s00520-018-4627-x]
- 8 **Maass SWMC**, Boerman LM, Brandenbarg D, Verhaak PFM, Maduro JH, de Bock GH, Berendsen AJ. Symptoms in long-term breast cancer survivors: A cross-sectional study in primary care. *Breast* 2020; **54**: 133-138 [PMID: 33035934 DOI: 10.1016/j.breast.2020.09.013]
- 9 **Selvy M**, Pereira B, Kerckhove N, Gonneau C, Feydel G, Pétorin C, Vimal-Baguet A, Melnikov S, Kullab S, Hebbar M, Bouché O, Slimano F, Bourgeois V, Lebrun-Ly V, Thuillier F, Mazard T, Tavan D, Benmammar KE, Monange B, Ramdani M, Péré-Vergé D, Huet-Penz F, Bedjaoui A, Genty F, Leyronnas C, Busserolles J, Trevis S, Pinon V, Pezet D, Balayssac D. Long-Term Prevalence of Sensory Chemotherapy-Induced Peripheral Neuropathy for 5 Years after Adjuvant FOLFOX Chemotherapy to Treat Colorectal Cancer: A Multicenter Cross-Sectional Study. *J Clin Med* 2020; **9** [PMID: 32727095 DOI: 10.3390/jcm9082400]
- 10 **Winters-Stone KM**, Horak F, Jacobs PG, Trubowitz P, Dieckmann NF, Stoyles S, Faithfull S. Falls, Functioning, and Disability Among Women With Persistent Symptoms of Chemotherapy-Induced Peripheral Neuropathy. *J Clin Oncol* 2017; **35**: 2604-2612 [PMID: 28586243 DOI: 10.1200/JCO.2016.71.3552]
- 11 **Banach M**, Juranek JK, Zygulska AL. Chemotherapy-induced neuropathies-a growing problem for patients and health care providers. *Brain Behav* 2017; **7**: e00558 [PMID: 28127506 DOI: 10.1002/brb3.558]
- 12 **Cheng HL**, Molassiotis A, Leung AKT, Wong KH. Docetaxel-Induced Peripheral Neuropathy in Breast Cancer Patients Treated with Adjuvant or Neo-Adjuvant Chemotherapy. *Breast Care (Basel)* 2021; **16**: 269-275 [PMID: 34248468 DOI: 10.1159/000507843]
- 13 **Wang YJ**, Chan YN, Jheng YW, Wu CJ, Lin MW, Tseng LM, Tsai YF, Liu LC. Chemotherapy-induced peripheral neuropathy in newly diagnosed breast cancer survivors treated with taxane: a prospective longitudinal study. *Support Care Cancer* 2021; **29**: 2959-2971 [PMID: 33025227 DOI: 10.1007/s00520-020-05796-0]
- 14 **Oken MM**, Creech RH, Tormey DC, Horton J, Davis TE, McFadden ET, Carbone PP. Toxicity and response criteria of the Eastern Cooperative Oncology Group. *Am J Clin Oncol* 1982; **5**: 649-655 [PMID: 7165009]
- 15 **National Cancer Institute**. Common Terminology Criteria for Adverse Events (CTCAE). [cited 11 Dec 2021]. Available from: [https://evs.nci.nih.gov/fp1/CTCAE/CTCAE\\_4.0/Archive/CTCAE\\_4.0\\_2009-05-29\\_QuickReference\\_8.5x11.pdf](https://evs.nci.nih.gov/fp1/CTCAE/CTCAE_4.0/Archive/CTCAE_4.0_2009-05-29_QuickReference_8.5x11.pdf)
- 16 **Abu Sharour L**. Psychometric evaluation of the Arabic Version the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire for Chemotherapy-Induced Peripheral Neuropathy Questionnaire (EORTC QLQ-CIPN20). *Appl Neuropsychol Adult* 2021; **28**: 614-618 [PMID: 31612735 DOI: 10.1080/23279095.2019.1677232]
- 17 **Derogatis LR**. The psychosocial adjustment to illness scale (PAIS). *J Psychosom Res* 1986; **30**: 77-91 [PMID: 3701670 DOI: 10.1016/0022-3999(86)90069-3]
- 18 **Yao JJ**, Chen RN, Liu YY, Yuan CR. A study of psychosocial adaptation status of cancer patients and its affecting factors. *Nurs J Chin PLA* 2013; **30**: 7-11, 16 [DOI: 10.3969/j.issn.1008-9993.2013.07.002]
- 19 **Tanay MAL**, Armes J, Ream E. The experience of chemotherapy-induced peripheral neuropathy in adult cancer patients: a qualitative thematic synthesis. *Eur J Cancer Care (Engl)* 2017; **26** [PMID: 26786536 DOI: 10.1111/ecc.12443]
- 20 **de Souza C**, Santos AVSL, Rodrigues ECG, Dos Santos MA. Experience of Sexuality in Women with Gynecological Cancer: Meta-Synthesis of Qualitative Studies. *Cancer Invest* 2021; **39**: 607-620 [PMID: 33826457 DOI: 10.1080/07357907.2021.1912079]
- 21 **Wimberly SR**, Carver CS, Laurenceau JP, Harris SD, Antoni MH. Perceived partner reactions to diagnosis and treatment of breast cancer: impact on psychosocial and psychosexual adjustment. *J Consult Clin Psychol* 2005; **73**: 300-311 [PMID: 15796638 DOI: 10.1037/0022-006X.73.2.300]
- 22 **Carreira H**, Williams R, Dempsey H, Stanway S, Smeeth L, Bhaskaran K. Quality of life and mental health in breast cancer survivors compared with non-cancer controls: a study of patient-reported outcomes in the United Kingdom. *J Cancer Surviv* 2021; **15**: 564-575 [PMID: 33089480 DOI: 10.1007/s11764-020-00950-3]
- 23 **Chan CW**, Cheng H, Au SK, Leung KT, Li YC, Wong KH, Molassiotis A. Living with chemotherapy-induced peripheral neuropathy: Uncovering the symptom experience and self-management of neuropathic symptoms among cancer survivors. *Eur J Oncol Nurs* 2018; **36**: 135-141 [PMID: 30322504 DOI: 10.1016/j.ejon.2018.09.003]
- 24 **Schmidt ME**, Scherer S, Wiskemann J, Steindorf K. Return to work after breast cancer: The role of treatment-related side effects and potential impact on quality of life. *Eur J Cancer Care (Engl)* 2019; **28**: e13051 [PMID: 31033073 DOI: 10.1111/ecc.13051]
- 25 **Kolb NA**, Smith AG, Singleton JR, Beck SL, Howard D, Dittus K, Karafiath S, Mooney K. Chemotherapy-related neuropathic symptom management: a randomized trial of an automated symptom-monitoring system paired with nurse practitioner follow-up. *Support Care Cancer* 2018; **26**: 1607-1615 [PMID: 29204710 DOI: 10.1007/s00520-017-3970-7]
- 26 **Kudre D**, Chen Z, Richard A, Cabaset S, Dehler A, Schmid M, Rohrmann S. Multidisciplinary Outpatient Cancer Rehabilitation Can Improve Cancer Patients' Physical and Psychosocial Status-a Systematic Review. *Curr Oncol Rep* 2020; **22**: 122 [PMID: 33001322 DOI: 10.1007/s11912-020-00979-8]
- 27 **Aricò D**, Raggi A, Ferri R. Cognitive Behavioral Therapy for Insomnia in Breast Cancer Survivors: A Review of the Literature. *Front Psychol* 2016; **7**: 1162 [PMID: 27536265 DOI: 10.3389/fpsyg.2016.01162]

- 28 **Wilbeck J**, Schorn MN, Daley L. Pharmacologic management of acute pain in breastfeeding women. *J Emerg Nurs* 2008; **34**: 340-344 [PMID: [18640416](#) DOI: [10.1016/j.jen.2007.07.006](#)]
- 29 **Childs DS**, Yoon HH, Eiring RA, Jin Z, Jochum JA, Pitot HC, Jatoi A. Falls: descriptive rates and circumstances in age-unspecified patients with locally advanced esophageal cancer. *Support Care Cancer* 2021; **29**: 733-739 [PMID: [32447502](#) DOI: [10.1007/s00520-020-05511-z](#)]
- 30 **Trompetter HR**, Bonhof CS, van de Poll-Franse LV, Vreugdenhil G, Mols F. Exploring the relationship among dispositional optimism, health-related quality of life, and CIPN severity among colorectal cancer patients with chronic peripheral neuropathy. *Support Care Cancer* 2022; **30**: 95-104 [PMID: [34232392](#) DOI: [10.1007/s00520-021-06352-0](#)]



Published by **Baishideng Publishing Group Inc**  
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

**Telephone:** +1-925-3991568

**E-mail:** [bpgoffice@wjgnet.com](mailto:bpgoffice@wjgnet.com)

**Help Desk:** <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

